IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended):  A method of estimating values for signals of a sequence of signals transmitted from a transmitter through a channel to a receiver, providing a received signal, the method employing a plurality of particles, each particle comprising a postulated transmitted signal history, the method comprising:

~~initializing~~ initializing a set of said particles;

evolving said set of particles over time using said received signal to generate a succession of evolved sets of particles;

tracing a plurality of paths through said succession of evolved sets of particles backwards in time; and

determining a sequence of values for said transmitted sequence of signals using said paths.

Claim 2 (Original):  A method as claimed in claim 1 wherein said evolving of a set of particles comprises:

determining a set of candidate successor particles and associated candidate particle weights; and

selecting particles for an evolved set from said set of candidate particles based upon said weights.

Claim 3 (Original):  A method as claimed in claim 2, comprising determining weights for said successor particles dependent upon said received signal.

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Claim 4 (Original): A method as claimed in claim 3 wherein said determining of a said successor particle weight comprises comparing a postulated transmitted signal associated with said successor particle, modified by a response of said channel, with said received signal.

Claim 5 (Original): A method as claimed in claim 4 wherein said channel response is determined at least in part using said values for said transmitted sequence of signals.

Claim 6 (Original): A method as claimed in claim 2 wherein said weights define a probability distribution for said selecting, the method further comprising flattening said probability distribution prior to said selecting.

Claim 7 (Original): A method as claimed in claim 1 wherein said signal history comprises a history over a length of said channel.

Claim 8 (Original): A method as claimed in claim 1 wherein said path tracing comprises selecting transitions between particles of successively evolved sets of particles, working from a later set of particles to an earlier set of particles.

Claim 9 (Original): A method as claimed in claim 8 wherein said transition selecting selects only allowed transitions.

Claim 10 (Original): A method as claimed in claim 9 wherein a said allowed transition comprises a transition between particles which share at least a portion of their signal histories.

Claim 11 (Original): A method as claimed in claim 8 wherein each transition has an associated transition likelihood value and wherein said selecting of a transition is dependent upon said transition likelihood value.

Claim 12 (Original): A method as claimed in claim 1 wherein said values for said transmitted sequence of signals comprise likelihood values for signals of said sequence.

Claim 13 (Original): A method as claimed in claim 12 wherein said determining of said sequence of likelihood values for said transmitted signal sequence comprises determining a likelihood value for a most likely transmitted signal value at a time corresponding to an evolved set of particles for each evolved set of particles.

Claim 14 (Original): A method as claimed in claim 13 wherein said determining of a transmitted signal likelihood value for an evolved set of particles comprises counting the number of said paths through particles in said evolved set having said transmitted signal value at a time corresponding to said evolved set.

Claim 15 (Original): A method as claimed in claim 1 further comprising using said likelihood values as *a priori* information for repeating said evolving, tracing and determining for improving said estimating.

Claim 16 (Original): A method of estimating a transmitted sequence of signals comprising estimating likelihood values as claimed in claim 11 and estimating said

transmitted sequence by making decisions on said transmitted signals of said sequence using said likelihood values.

Claim 17 (Original): A method as claimed in claim 16 wherein said transmitter has a plurality of transmit antennas and wherein a said particle comprises a postulated signal history for each said transmit antenna.

Claim 18 (Original): A method as claimed in claim 1 wherein said transmitter has a plurality of transmit antennas and wherein a said particle comprises a postulated signal history for each said transmit antenna.

Claim 19 (Original): A method as claimed in claim 1 in which said evolving over time and said tracing backwards in time comprises additionally or alternatively evolving over frequency and tracing backwards in frequency.

Claim 20 (Currently Amended): A method of ~~equalising~~ equalizing received signal data using the method of claim 1.

Claim 21 (Currently Amended): A carrier carrying processor control code to, when running, implement a method of estimating values for signals of a sequence of signals transmitted from a transmitter through a channel to a receiver, providing a received signal, the method employing a plurality of particles, each particle comprising a postulated transmitted signal history, the method comprising:

~~initialising~~ initializing a set of said particles;

evolving said set of particles over time using said received signal to generate a succession of evolved sets of particles;

tracing a plurality of paths through said succession of evolved sets of particles backwards in time; and

determining a sequence of values for said transmitted sequence of signals using said paths.

Claim 22 (Currently Amended): A signal estimator for estimating values for signals of a sequence of signals transmitted from a transmitter through a channel to a receiver providing a received signal, the estimator employing a plurality of particles, each particle comprising a postulated transmitted signal history, the estimator comprising:

means for ~~initialising~~ initializing a set of said particles;

means for evolving said set of particles over time using said received signal to generate a succession of evolved sets of particles;

means for tracing a plurality of paths through said succession of evolved sets of particles backwards in time; and

means for determining a sequence of values for said transmitted sequence of signals using said paths.

Claim 23 (Currently Amended): An ~~equaliser~~ equalizer including the signal estimator of claim 22.

Claim 24 (Original): A signal processor configured to provide a soft output of transmitted signal values from a received signal comprising:

a first filter configured to generate a time sequence of sets of samples from populations of candidate samples weighted using said received signal, each sample corresponding to a sequence of transmitted signal values;

a second filter to select a plurality of time sequences of said samples from said time sequence of sets of samples; and

a signal estimator to estimate a sequence of transmitted signal values from said plurality of sample time sequences to provide said soft output.

Claim 25 (Original): A signal processor as claimed in claim 24 wherein said first filter is configured to generate said time sequence by selecting said sets of samples from said populations in accordance with said weighting of said candidate samples.

Claim 26 (Original): A signal processor as claimed in claim 25 wherein said weighting is further dependent upon a channel response for a channel between said transmitter and said receiver.

Claim 27 (Original): A signal processor as claimed in claim 24 wherein said second filter is configured to select a said time sequence by tracing a path of allowed transitions between said samples of said sets of samples.

Claim 28 (Original): A signal processor as claimed in claim 27 wherein said tracing traces from a first sample- to a second sample, said second sample representing a sequence of signal values for an earlier time than said first sample.

Claim 29 (Original): A signal processor as claimed in claim 24 wherein said first filter comprises a particle filter.

Claim 30 (Original): A signal processor as claimed in claim 24 wherein said received signal comprises signals received simultaneously from a plurality of transmitting devices, and wherein said signal processor configured for estimating a sequence of transmitted signal values for each said transmitting device.

Claim 31 (Currently Amended): An ~~equaliser~~ equalizer incorporating the signal processor of claim 24.

Claim 32 (Original): A signal processor configured to provide a hard output of transmitted signal values from a received signal comprising: a signal processor configured to provide a soft output of transmitted signal values from a received signal comprising:

a first filter configured to generate a time sequence of sets of samples from populations of candidate samples weighted using said received signal, each sample corresponding to a sequence of transmitted signal values;

a second filter to select a plurality of time sequences of said samples from said time sequence of sets of samples; and

a signal estimator to estimate a sequence of transmitted signal values from said plurality of sample time sequences to provide said soft output, and

decision means to provide a hard output from said soft output.

Claim 33 (Original): A signal processor as claimed in claim 32 wherein said received signal comprises signals received simultaneously from a plurality of transmitting devices, and

wherein said signal processor configured for estimating a sequence of transmitted signal values for each said transmitting device.

Claim 34 (Currently Amended): An ~~equaliser~~ equalizer incorporating the signal processor of claim 32.

Claim 35 (Original): Processor control code to, when running, implement a signal processor configured to provide a soft output of transmitted signal values from a received signal comprising:

a first filter configured to generate a time sequence of sets of samples from populations of candidate samples weighted using said received signal, each sample corresponding to a sequence of transmitted signal values;

a second filter to select a plurality of time sequences of said samples from said time sequence of sets of samples; and

a signal estimator to estimate a sequence of transmitted signal values from said plurality of sample time sequences to provide said soft output.

Claim 36 (Original): A signal processor configured to provide a hard output of transmitted signal values from a received signal comprising:

a signal processor configured to provide a soft output of transmitted signal values from a received signal comprising:

a first filter configured to generate a time sequence of sets of samples from populations of candidate samples weighted using said received signal, each sample corresponding to a sequence of transmitted signal values;

a second filter to select a plurality of time sequences of said samples from said time sequence of sets of samples; and

a signal estimator to estimate a sequence of transmitted signal values from said plurality of sample time sequences to provide said soft output; and

decision means to provide a hard output from said soft output.